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ABSTRACT

Adapted screening devices and teacher observation were used in a 1974 study of 1003 Finnish students (ages 6-8) in an effort to predict future learning difficulties. Six areas were assessed: gross motor skills, sensory-motor integration, perceptual-motor skills, arithmetic skills, socioemotional adjustment, and verbal ability. In a follow-up study with 104 students nine years later (1983), it was reported that socioemotional adjustment, perceptual-motor skills, and arithmetic ability were found to be the best predictors of future school achievement. Teachers were reported to predict school achievement and behavior more accurately than did screening devices, particularly in the spring semester of the first year of school. (Author/JW)

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PREDICTING LEARNING DIFFICULTIES IN THE BEGINNING OF
SCHOOL. A 9-year follow-up study in the Finnish com-
pulsory education

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Paper presented at the
63rd Annual Convention

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Predicting LDs/Tuunainen 4/85

ABSTRACT

This paper reviews two studies concerning the prediction of learning difficulties in the beginning of the school. The original study (Tuunainen 1977) focused on language difficulties and was based on the following six areas: 1. Gross motor skills, 2. Sensory-motor integration, 3. Perceptual motor skills, 4. Arithmetic, 5. Socio-emotional adjustment and 6. Verbal ability (and vocabulary). The study was carried out in the Finnish compulsory education with students of 6 to 8 years of age (N= 1003), as a screening system. The other part consists of the master's thesis in special education by Tiina Onatsu and Marja-Liisa Tarvainen (1984, advisor Kari Tuunainen), a follow-up study that focused on 104 first graders in 1974, after 9 years at school. The best predictors in school achievements were socio-emotional screening, perceptual-motor skills and arithmetic ability when scholastic achievements in general and mother tongue grades were used as criteria.

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PREDICTING LEARNING DIFFICULTIES IN THE BEGINNING OF SCHOOL:

A 9-year follow-up study in the Finnish compulsory education

Kari Tuunainen, University of Joensuu, Finland

A vast research literature documents the development of the terminology in learning difficulties or disabilities (Kirk-Batteman 1962, Hallahan-Kauffman 1976, Kirk-Gallagher 1979, Rourke 1981). The concepts seem to follow the sequence impairment, disability and handicap as in the WHO definition of 1980. There are certain differences in approaches, but at school it is necessary to take into account at least the student and the (school)environment including the teacher. Also it is possible to focus on very general traits or phenomena or on very specific individual difficulties. One distinction seems to be that between neurosciences and more behavioral approaches as Gadde(1980)has pointed out.

When screening, diagnosing or assessing students the background models are very important. Haertel, Walberg and Weinstein (1983) summarize psychological models of educational performance, but it is useful to go beyond the models or paradigms. Sperry (1977) categorizes some approaches according to medical, behavioral, sociological and existential models. Due to those models also aims and methods of assesment are different.

In the original study (Tuunainen 1977) the basis were language difficulties and the mother tongue was thought to be the most important corner stone of personality development, the key. According to this there are many bodies of knowledge which are of

value in developing screening methods. Psycholinguistics in general, the very rich tradition of perceptual-motor and other skills, linguistic results and other orientations in special education (Halliday 1973, Wedell 1976, Cruickshank 1976).

Also the roots of the Finnish curriculum of 1970 are based on the Bloomian concept of the three main parts of personality. On the other hand there has never been a very test-oriented tradition like in the US. For instance in the report of the National Commission on Excellence in Education (A Nation at Risk 1983) of the thirteen indicators of risk eleven (!) are test bound. Screening methods have been used mostly in health care, but they are feasible also in education. Assessment in a nondiscriminatory form is always a very central issue (Gearhart 1980). It is always a question of decision making when assessing, diagnosing or screening students, and the teacher has the main role in this process. There is wide evidence (Haring et al 1967, Brophy et al 1974, Good et al 1975) that teachers make a difference and that is why grades and estimates given by teachers are of great importance.

The present study

The original study (Tuunainen 1977) tried to take into account the Finnish Comprehensive School situation, the educational system had been reformed in 1972 - 1979. Joensuu was already in 1974 within the reformed system and the teachers who volunteered (N= 42) were very eager to get new ideas for school practise. From the point of view of the mother tongue, language development in the beginning of the school was divided into

six subareas: 1. Gross motor skills, 2. Sensory-motor integration, 3. Perceptual-motor skills, 4. Arithmetic ability, 5. Socio-emotional adjustment and 6. Verbal ability (+vocabulary). Screening methods were developed or revised from the research literature.

Motor development tasks were based on Wedell (1970), Valett (1967), as some of sensory-motor integration tasks. Perceptual-motor tasks have been traditionally used in reading and school readiness studies, as well as arithmetic ability. The socio-emotional area was estimated with Hewett (1967) tasks for children, which were based on Maslow's theory. Additionally the teacher's estimations on the 5-point scale concerning students' general school achievement were developed. All the instruments were designed for the teacher's use, mostly as group methods, during the lessons.

It was no surprise that so wide screening when using a 15 % limit on each variable took in 43.9 % of students. False positives were sure with, but that gave a rather good chance for predicting later. Teachers were asked to name student who would have difficulties during their school Emanuelsson (1984) speaks of the 'educational handicap', which refers to labels and difficulties produced by school.

In the follow-up study (Oksanen-Tarvainen 1984) some parts of the problems are omitted, but presented as a figure the design is as follows:

(Figure 1)

The main problem is: What kind of screening information in the beginning of school predicts best school achievements in the

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end of the compulsory education, after nine years of schooling. In this paper some subproblems were omitted.

The follow-up study (Onatsu-Tarvainen 1984) carried out during the spring 1983 when the students were leaving school. Due to practical reasons the sample included only those who had completed their school in Joensuu. The sample may be selectively gathered but family moving is not tied only to the sovio-economic background or some known factors. Also students in special classes or institutions (about 0.4%) were omitted.

Some main results

Predicting some influence is a very difficult task and the same problem concerns, except education, also therapy methods, medicament or even violent behavior (Monahan 1983). In this study we summarize very shortly three categories of results:

1. Student screening methods

In general it can be said that by observing students in the beginning of school it is possible to predict their behavior and achievements later with rather good probability. Problems can be found in screening methods, reliability and validity of chosen methods and so on. In this study most of the student variables chosen had strong intercorrelations with the main criteria, general school achievement and especially the grades in mother tongue. The connection might be technical, but some real variance seems to be with.

Widely spoken school culture expects some general traits or be-

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havior and perhaps rewards according to them. (Some people doubt that the most important characteristic that school presumes, is the ability to stand monotony!). Anyway, correlation coefficients are for screening variables (1974) and school report (1983) as follows:

Table 1

The best predictive value seems to be in socio-emotional, arithmetic and perceptual-motor variables. It is problematic that reliability coefficients were rather low (.29 - .75). On the other hand some other low connections may be due to this.

2. Teacher estimates as predictors

Teachers gave first estimates in the middle of the first school year with the scale 1-3, estimating general adjustment, participation, concentration, reading, writing and arithmetic. In the first spring they estimated with the scale 1-5 more holistic the future (1= cannot manage in regular classroom, 2= needs special support, 3= average student, 4= no problems, 5= just fine). Main results are:

Table 2

Teachers seem to estimate school achievement and behavior more accurately in advance than screening methods. That supports the hypothesis that teachers can predict very early what kind of school career student will have. This cannot be generalized outside school, occupation or marriage, though we have some really longitudinal evidence from the Terman study by Robert Sears. The best predictor seems to be the spring estimate during the first school year. ($r = .37 - .57$).

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Additionally differences were found between the genders, girls had higher grades.

3. Self concept

All students in the 1984 study were interviewed with an instrument modified from Coopersmith (1967). In general students seem to be optimistic, energetic, and ambitious at that age. Also they seem to be very social and human centered. Girls seem to be more labile and human-centered than boys. The differences are very preliminary, so more interpretation is not needed.

Discussion

One very interesting field for further study can be found here and it is possible to think that self-concept, self-appreciation and other similar characteristics are of value when trying to figure out school achievement and connections to real life. If you have self-confidence, energy, ambition and so on, maybe you survive better in the vying for excellence - maybe you lack quality of life. It depends on the culture outside, school and family traditions, and other ecological factors.

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Original study (Tuunainen 1977)

Follow-up study

(Onatsu-Tarvainen 1984)

Fall 1974

Spring 1975 - - - - - Spring 1983

Student screening

School achievement

Teacher estimates(1-3)

Self concept

Teacher

estimates 1-5

Total N= 465

Total N= 104

LDs N= 190

LDs N= 60

Cntrl N= 275

Cntrl N= 44

First graders

Ninth graders

Not found at
the same school
N=361

Figure 1: Design of the study

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First graders

1. Gross motor skills	-19	-19	-03	-19	-17
2. Socio-emotional area	-43	-31	-17	-36	-36
3. Arithmetic	-41	-23	-35	-32	-36
4. Perceptual-motor skills	-37	-32	-25	-43	-46

- - -

Ninth graders: 1. 2. 3. 4. 5.

1. Grades in mother tongue (reading)
2. Grades in mother tongue (writing)
3. Grades in math
4. Average (arts and sports not incl.)
5. Average (all grades)

r= .23, p .05 N= 60

r= .31, p .01

r= .41, p .001

Table 1: Correlation coefficients between some first grade screening methods and ninth grade grades

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First graders (teacher's estimates)

1. Adjustment	31	41	17	29	28
2. Participation	37	35	43	44	48
3. Concentration	43	36	30	35	36
4. Reading	10	11	05	07	08
5. Writing	33	33	12	28	26
6. Math	33	30	33	41	38
7. Teacher's spring estimate	54	41	36	57	54

Ninth graders: 1. 2. 3. 4. 5.

1. Grades in mother tongue (reading)

2. Grades in mother tongue (writing)

3. Grades in math

4. Average (arts and sports not incl)

5. Average (all grades)

r = .23, p .05 N = 60

r = .31, p .01

r = .41, p .001

Table 2: Correlation coefficients between teacher's estimates
in the beginning of the school and the ninth year grades

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